

APPENDIX 3

Demonstration of Progress in Reducing VOC Emissions

Areas designated as nonattainment for the 1-hour ozone standard are required to reduce VOC emissions 3% per year from “adjusted” 1990 levels until the areas attain the ozone standard and get reclassified as attainment maintenance areas. For severe ozone areas, Rate of Progress (ROP) plans are required to meet milestone years in 1996 (15%), 1999 (24%), 2002 (33%), 2005 (42%) and 2007 (48%). For each milestone plan, an additional 3% reduction is required as a contingency measure. The first State Implementation Plan (SIP) revision dealing with ROP was submitted to EPA in late 1993. The 1999 ROP SIP revision was submitted in 1997. The SIP revision for the remaining ROP milestones (2002, 2005 and 2007) is due as part of the attainment demonstration that must be submitted to EPA by December 31, 2000.

For areas where NO_x control is necessary or appropriate as a strategy to reduce ozone concentrations, NO_x reductions may be substituted for VOC reductions. EPA guidance allows NO_x reductions as a substitute for VOC reductions for ROP milestones beginning in 1999.

Wisconsin’s ROP SIP revisions for 1996 and 1999 used only VOC emission reductions. Reductions in VOC emissions were believed to be the most appropriate means to improve ozone air quality. The 1996 ROP Plan (“15% Plan”) for SE Wisconsin primarily relied on the CAA control measures to reach a 15% VOC reduction. Federal programs to reduce VOC emissions included reformulated gasoline, clean fuel fleets, and revised motor vehicle emission standards. State plan elements included VOC RACT for major sources, enhancement to the I/M program, Stage 2 gasoline fueling vapor recovery, solvent limits for various coatings applications and a handful of “voluntary” industrial solvent regulation enhancements. Emission reduction elements from the 1996 ROP and additional emission reductions from federal programs, when projected, suggested that no additional Wisconsin specific VOC reductions were needed to meet the 1999 ROP requirement. VOC emission reductions are expected to continue, but these will not be sufficient, by themselves, to meet future ROP requirements. NO_x emission reductions will be needed to cover ROP and contingency requirements in 2002, 2005, and 2007. The ROP emission reduction goal plus the 3% contingency emission reduction goal for these milestone years are 36% in 2002, 45% in 2005, and 51% in 2007.

EPA has developed guidance on NO_x emission reduction substitution in ROP plans. This guidance requires a technical demonstration to support the claim that NO_x emission reductions are effective. NO_x emission reductions may be substituted for VOC emission reductions so long as the VOC percentage reduction from the 1990 VOC adjusted emissions baseline plus the NO_x percentage reduction from the 1990 NO_x adjusted emissions baseline, when added together, are greater than or equal to the required ROP percentage reduction.

The four Lake Michigan states previously received a waiver to the NO_x RACT controls otherwise required for the Severe Ozone counties in Wisconsin. The waiver was based on modeling performed through 1994. Subsequent regional ozone control modeling efforts, beginning with the Ozone Transport Assessment modeling from 1995 through 1997, established the need for regional NO_x reductions to address ozone attainment across the Eastern US, including in the Lake Michigan area.

The current air quality modeling for the Lake Michigan region, conducted for this attainment demonstration, verifies the need for strong regional NO_x control to further reduce ozone concentrations. While additional VOC emission reductions in large metropolitan areas will reduce ozone levels they are more expensive than regional NO_x emission reductions

Summary of the Post-2000 NO_x-based Progress Plans:

Tables 3-1 through 3-6 illustrate the proposed VOC and NO_x emission reductions necessary to meet the 2002, 2005 and 2007 ROP milestones. They show estimates of the actual VOC and NO_x reductions from the adjusted 1990 baselines achieved through continued implementation of the 1996 and 1999 plans.

The area proposed for ROP emission reductions is the “Primary Ozone Control Region.” The Primary Ozone Control Region includes the nine nonattainment counties that were included in the 1996 ROP plan. For the 2007 attainment demonstration, a Secondary Ozone Control Region, incorporating an additional 21 counties with emissions shown to directly impact ozone attainment, is also defined in rule as a region where non-ROP emission reduction requirements will apply. ROP applies only to the Primary Ozone Control Region. The percent emission reduction requirements are translated into ROP budgets that define the NO_x emission reduction targets for affected sources (*see Appendix 1 – NO_x Control Plan Summary Matrix*).

VOC emissions for 2002, 2005 and 2007 are slightly higher than prior estimates because of new information on activity levels and creditability of emission reductions. Under this proposal, the additional emission reductions needed for future ROP milestones (including the 3% contingency) will be achieved by reducing NO_x emissions.

Emission reductions are shown for the Primary Ozone Control Region. Since the presentation of the draft proposal to the Board in April 2000, newer EPA guidance on projected mobile sector emissions (resulting from refined Tier 2 standard impact estimates) have resulted in very slight modifications to the mobile sector budgets noted in **Table 3-2**.

The draft proposal requested comment on the appropriateness of ROP controls on sources in the Primary Ozone Control Region and on expanding the Progress-related NO_x control effort to sources in the Secondary Ozone Control Region to help ensure attainment maintenance.

Table 3-1 Proposed Ozone ROP Budgets – 2002, 2005, 2007

% Reduction Relative to “1990 Adjusted Baseline”	2002 (“36%”)		2005 (“45%”)		2007 (“51%”)	
	VOC 333 tpd Baseline	NOx 393 tpd Baseline	VOC 331 tpd Baseline	NOx 391 tpd Baseline	VOC 331 tpd Baseline	NOx 390 tpd Baseline
Primary Ozone Control Region Budget	234 tpd	368 tpd	225 tpd	340 tpd	218 tpd	324 tpd
Creditable Reduction	29.8%	6.2%	32%	13%	34.1%	16.9%

Table 3-2 1-Hr Ozone Attainment Demonstration – Proposed Mobile Sector Budgets

Counties with Ozone Attainment or Maintenance Conformity Budgets	2002		2005 April, 2000 Draft Plan		2007 April, 2000 Draft Plan		2005 May, 2000 Proposal ²		2007 May, 2000 Proposal ²	
	VOC (TPD)	NOx (TPD)	VOC (TPD)	NOx (TPD)	VOC (TPD)	NOx (TPD)	VOC (TPD)	NOx (TPD)	VOC (TPD)	NOx (TPD)
Milwaukee, Racine, Kenosha, Waukesha, Washington, & Ozaukee	44.39	94.85- 106.64 ¹	37.86	77.77- 86.01	33.35	66.53- 71.91	37.5	76.0- 84.7	32.9	63.8-69.7
Sheboygan	4.45	9.36- 10.26	3.84	7.75- 8.36	3.41	6.78- 7.17	3.7	7.4-8.0	3.3	6.4-6.8
Manitowoc & Kewaunee	6.56	11.77	6.27	10.11	6.20	9.00	6.3	10.4	6.3	9.8

¹Denotes Budget with and without I/M cutpoints, assumes high VMT growth and 7.5% buffer.

²Represents projections resulting from refined EPA guidance on the impact of Tier 2 and low sulfur fuel.

Table 3-3 Rate-of-Progress Requirement for 2002

2002 Planning Objective = **6.2% NO_x and 29.8% VOC** Reduction to Adjusted 1990 Baselines, the Incremental **NO_x Reduction Target = 66 Tons per Ozone Day** for 9 Counties (Region 1)
(Baseline is 393 Tons, Forecast Emissions are 434 Tons, 93.8% of Baseline=368 Ton Budget)

Control Measures Evaluated for Progress 2002:

Sector – Measure	Tons Impact 2002	Cost Range (\$/Ton)
Mobile - I/M Cutpoints on May 1, 2001	12	1400
Performance Standards for Existing Facilities	9	(-500) to 650
Utility – System Emission Rate 0.30 Assumes both I/M Cutpoints and Perf. Standards.	42	150 to 850 700 avg
Utility – System Emission Rate 0.24 Assumes neither I/M Cutpoints nor Perf. Standards	66	1000 to 2000 1150 avg

Discrete 2002 Plan Options for Comment:

- Option A: I/M Cutpoints, Performance Standards, and EGUs emission rate 0.30 lb/mmbtu
- Option B: I/M Cutpoints, No Performance Standards, and EGU emission rate 0.27 lb/mmbtu
- Option C: No I/M Cutpoints, Performance Standards, and EGU emission rate 0.26 lb/mmbtu
- Option D: No I/M Cutpoints, No Performance Standards, and EGU emission rate 0.24 lb/mmbtu

Table 3-4 Rate-of-Progress Requirement for 2005

2005 Planning Objective = **13% NO_x and 32% VOC** Reduction to Adjusted 1990 Baselines, the Incremental **NO_x Reduction Target = 71 Tons per Ozone Day** for 9 Counties (Region 1)
(Baseline is 391 Tons, Forecast Emissions are 411 Tons, 87% of Baseline=340 Ton Budget)

Control Measures Evaluated for Progress 2005:

Sector – Measure	Tons Impact 2002	Cost Range (\$/Ton)
Mobile - I/M Cutpoints on May 1, 2001	9	1400-2200
Performance Standards for Existing Facilities	9	(-500) to 650
Utility – System Emission Rate 0.28 Assumes both I/M Cutpoints and Perf. Standards	54	400 – 1900 700 avg
Utility – System Emission Rate 0.23 Assumes neither I/M Cutpoints nor Perf. Standards	71	1200-1900 1350 avg

Discrete 2005 Plan Options for Comment:

- Option A: I/M Cutpoints, Performance Standards, and EGUs emission rate 0.28 lb/mmbtu
- Option B: I/M Cutpoints, No Performance Standards, and EGU emission rate 0.25 lb/mmbtu
- Option C: No I/M Cutpoints, Performance Standards, and EGU emission rate 0.25 lb/mmbtu
- Option D: No I/M Cutpoints, No Performance Standards, and EGU emission rate 0.23 lb/mmbtu

Table 3-5 Rate-of-Progress Requirement for 2007

2007 Planning Objective = **17% NOx and 34% VOC** Reduction to Adjusted 1990 Baselines, the Incremental **NOx Reduction Target = 74 Tons per Ozone Day** for 9 Counties (Region 1)
(Baseline is 390 Tons, Forecast Emissions are 398 Tons, 83% of Baseline=324 Ton Budget)

Control Measures Evaluated for Progress 2007:

Sector – Measure	Tons Impact 2002	Cost Range (\$/Ton)
Mobile - I/M Cutpoints on May 1, 2001	6	1400-2800
Performance Standards for Existing Facilities	9	(-500) to 650
Utility – System Emission Rate 0.27 Assumes both I/M Cutpoints and Perf. Standards	59	400-1900 650 avg
Utility – System Emission Rate 0.22 Assumes neither I/M Cutpoints nor Perf. Standards	74	1200-1900 1350 avg

Discrete 2007 Plan Options for Comment:

- Option A: I/M Cutpoints, Performance Standards, and EGUs emission rate 0.27 lb/mmmbtu
- Option B: I/M Cutpoints, Performance Standards, and EGU emission rate 0.24 lb/mmmbtu
- Option C: No I/M Cutpoints, Performance Standards, and EGU emission rate 0.24 lb/mmmbtu
- Option D: No I/M Cutpoints, No Performance Standards, and EGU emission rate 0.22 lb/mmmbtu

Table 3-6 - OPTIONS FOR MEETING RATE-OF-PROGRESS Requirement

<u>Options for NOx Control to address ROP</u>	Option 1A EGUs and Large Industrial Sources	Option 1B Large EGUs only	Option 2A EGUs and Large Industrial Sources	Option 2B Large EGUs only
	With NOx Cutpoints <i>Includes Performance Standards in 2001 for New Facilities</i> Cutpoints = 12 tpd in 2002, 9 tpd in 2005 & 6 tpd in 2007		Without NOx Cutpoints <i>Includes Performance Standards in 2001 for New Facilities</i>	
2002 NOx Budget 368 tpd with 66 tpd reduction objective	<u>EGU Compliance Rate:</u> 0.30 lb/mmbtu Performance Standards for Existing Facilities are Fully Implemented	<u>EGU Rate Compliance:</u> 0.27 lb/mmbtu No Performance Standards	<u>EGU Compliance Rate:</u> 0.26 lb/mmbtu Performance Standards for Existing Facilities are Fully Implemented	<u>EGU Compliance Rate:</u> 0.24 lb/mmbtu No Performance Standards
2005 NOx Budget 340 tpd with 71 tpd reduction objective	<u>EGU Compliance Rate:</u> 0.28 lb/mmbtu Performance Standards for Existing Facilities are Fully Implemented	<u>EGU Compliance Rate:</u> 0.25 lb/mmbtu No Performance Standards	<u>EGU Compliance Rate:</u> 0.25 lb/mmbtu Performance Standards for Existing Facilities are Fully Implemented	<u>EGU Compliance Rate:</u> 0.23 lb/mmbtu No Performance Standards
2007 NOx Budget 324 tpd with 74 tpd reduction	<u>EGU Compliance Rate:</u> 0.27 lb/mmbtu Performance Standards for Existing Facilities are Fully Implemented	<u>EGU Compliance Rate:</u> 0.24 lb/mmbtu No Performance Standards	<u>EGU Compliance Rate:</u> 0.24 lb/mmbtu Performance Standards for Existing Facilities are Fully Implemented	<u>EGU Compliance Rate:</u> 0.22 lb/mmbtu No Performance Standards